Virginia Seaside Heritage Program

Restoring the Atlantic coast resources of Virginia's Eastern Shore. Developing management strategies for long-term resource protection and supporting the ecotourism and aquaculture industries.

Virginia Seaside Heritage Program: Hope Revived for Our Seaside Treasure

The seaside of Virginia's Eastern Shore - a vast system of barrier islands, bays, and salt marshes - is a global treasure. It has been designated by the United Nations as a Man and the Biosphere Reserve. The intertidal and shallow subtidal areas, undeveloped beaches and marshes support a marvelous array of waterfowl and shorebirds. These habitats also serve as breeding, nursery and foraging sites for finfish and shellfish, which are of tremendous economic value to commercial and recreational fishermen.

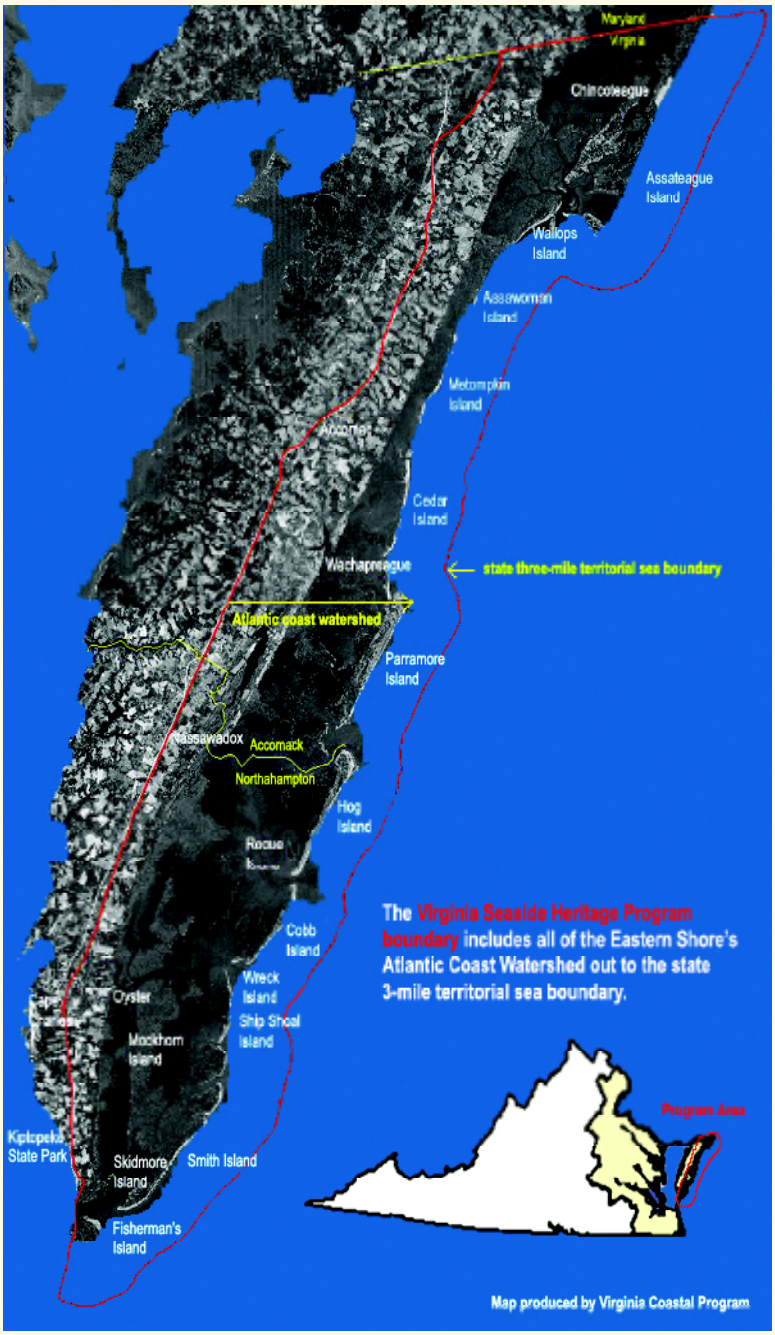
Today the seaside may look like a coastal wilderness. But it hasn't always been that way. British colonists first landed on its welcoming shores in the 1600's. Blackbeard and his pirates prowled these shores. By the 1800's, this barrier island lagoon system was a mecca for hunting, fishing, and recreating for people from Washington, D.C. to New York. Finfish and shellfish harvests provided income to thousands of Virginians. Unimaginable numbers of oysters, scallops, finfish, waterfowl and shorebirds were devoured from its seemingly limitless cornucopia.

But all that changed. Finfish and shorebird concentrations declined dramatically beginning in the late 1800's due to over-harvesting, disease, predation and loss of habitat. Powerful and destructive hurricanes and storms hit Virginia's seaside in the 1880's, '90's and early 1900's. Eventually, the cottages, hunt clubs, resorts and small communities were gone. As is so simply stated on the gravestone of Hog Island resident, Maggie Simpson (1844-1914), "How many hopes lie buried here." (from *Seashore Chronicles* by Barry Truitt and Brooks Miles Barnes)

Things have been fairly quiet on the seaside since the Great Depression. But sadly, we have not seen a great resurgence of underwater grasses, oysters, scallops, finfish and birds. Resource managers, scientists and the shore's residents have wondered why in the face of valiant conservation efforts over the last few decades have the resources not rebounded?

Maggie Simpson's hopes may not lie buried much longer. Recent restoration success has brought new hope to the Eastern Shore and a new public-private restoration partnership created by the Virginia Coastal Program - the ***Virginia Seaside Heritage Program*** - began in the fall of 2002.

Seagrass plays a pivitol role in the life of the Blue Crab and the Bay Scallop. Seagrass beds restored through the Virginia Seaside Heritage Program could signal the return of these and many other species. Photos courtesy of Virginia Institute of Marine Science and the Virginia Coastal Program.



The Virginia Seaside Heritage Program (VSHP) is addressing management of the aquatic resources of the barrier islands, bays, and salt marshes along the shore. This area holds tremendous potential to demonstrate appropriate management of economic development and habitat restoration within a rare and fragile ecosystem. The Virginia Coastal Program and its partners are in an ambitious four-year program aimed at restoration, use-conflict resolution, and protection of this global treasure. The VSHP builds on the momentum of recent restoration success, and is developing the tools necessary to support long-term restoration and management strategies on the seaside of Virginia's Eastern Shore.

Virginia Seaside Heritage Program: Goals and Progress

Habitat Restoration

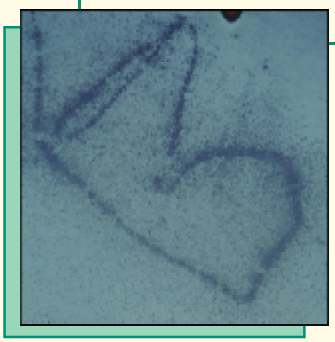
Eelgrass Restoration

Eelgrass recovery rates are very promising. Recent aerial photography shows a wonderful natural spread of grasses from restoration sites. The current method of large scale-restoration involves broadcasting seeds by hand instead of transplanting whole plants. In the fall of 2003, over 1.7 million seeds were dispersed in 35 half-acre plots in Cobb Bay and Spider Crab Bay by the Virginia Institute of Marine Science (VIMS). In the spring of 2004, another 6.87 million seeds were dispersed in 35 acres in plots ranging in size from 1 to 5 acres in Spider Crab Bay. VIMS will continue to monitor the rate of recovery of these beds and ambient water quality as the beds spread. VIMS, the Army Corps of Engineers, the Virginia Marine Resources Commission (VMRC), and the Nature Conservancy (TNC) are also currently negotiating sites for eelgrass restoration in Hog Island Bay where public grounds are limited.

In a complimentary project, VMRC staff is coordinating with TNC to raise bay scallops in eelgrass restoration areas in South Bay. It is hoped that these scallops will spawn and produce offspring. The scallops, which come from remnant stocks in Chincoteague Bay, are genetically distinct from the more northern strains of bay scallops found in Massachusetts to New York and from a more southern strain found in North Carolina. These genetic differences may prove to be very helpful in tracking the progress of scallop restoration on Virginia's Eastern Shore.

Harvested from reproductive shoots... Photo courtesy of VCZMP.

...thousands of tiny eelgrass are sowing big results on the seaside. Photo courtesy of VIMS.



Not only are the restored beds thriving but a natural spread from the restored areas are dramatic in recent aerials. Photo courtesy of VIMS.

Oyster Restoration

Oyster reef restoration efforts on the seaside continued, as VMRC constructed approximately three acres of reef in 2003 and 2004. This includes two acres in Gull Marsh and near Wreck Island and one acre in Gargathy Bay and Cockle Creek. Over 65,350 bushels of shell, harvested from nearby fossil shell deposits, were used. In 2002, spatset (the settlement of juvenile oysters) was fairly high in the Gull Marsh area (548 spat/meter), but poor in Gargathy Bay (12 spat/meter). Spatset was more promising in 2003, averaging 1000 spat/meter in Wreck Island and Cockle Creek. Future restoration sites include Cobb Island and the backside of Parramore Island.

The oyster is a keystone species. Oyster reefs provide habitat for many plant and animal species and help purify the water through their natural filtering process. Reefs reconstructed on Virginia's seaside show great promise. Photo courtesy of the Virginia Coastal Program.

Phragmites Mapping and Removal

On a national level, invasive species have been identified as the number two threat to biological diversity, second only to loss of species and habitat from development and urban sprawl. *Phragmites australis,* an invasive wetland grass also known as common reed, is one of the most serious and problematic invasive plant species in Virginia and other coastal States. This fast-spreading plant grows up to 4 meters tall and forms dense monotypic stands, crowding out other native marsh plants.

Disturbances that expose mineral substrate (i.e. dredging) or natural disturbances such as wildfires or hurricanes can increase the probability and rate of *Phragmites* colonization to a particular location. Although data is still being collected and analyzed by researchers at VCU, a huge spread of *Phragmites* on Parramore Island is attributed to a lightning induced wildfire in September 2002. The identification and treatment of *Phragmites* within high priority areas on the Seaside is necessary to slow the rate of spread of this species and protect natural biological diversity.

All patches of *Phragmites* on the mainland interface, lagoon system, and barrier islands of the Seaside were located, measured for area coverage and mapped using GPS methods during July to September 2004. Results indicate that approximately 2,024 acres of *Phragmites* currently exist on the Seaside in 1,404 patches with the largest patch covering 186 acres. An atlas of the distribution and abundance of *Phragmites* on the Shore was created using GPS field data from the DCR, supplemented by US. Fish & Wildlife data from Chincoteague Island. In order to prioritize *Phragmites* control efforts, these patches are being compared with known occurrences of sensitive rare species habitats and communities.

Phragmites has been mapped along the entire seaside of the Eastern Shore, including all Virginia's barrier islands (Parramore Island is at left). 1400 occurrences were documented via helicopter. Patches are as small as 1/4 acre and as large as 90 acres. Photos by Kevin Heffernan, DCR-NH.

Virginia Seaside Heritage Program: Goals and Progress

In the summer of 2005, emphasis will shift to *Phragmites* control, especially targeting high priority patches (e.g. high marsh communities) using both aerial and ground applications of approved herbicides. In 2004, *Phragmites* control efforts were hampered by the damaging effects of high winds and salt spray from Hurricane Isabel. Isabel caused "top kill" of many *Phragmites* strands – although the root system of the plant remained protected underground, the tops of the plants were destroyed, rendering herbicides as an ineffective control method. A new wetland herbicide - "Habitat", appears promising as it can be used earlier in the growing season (before hurricane season) and can eliminate *Phragmites* with one application.

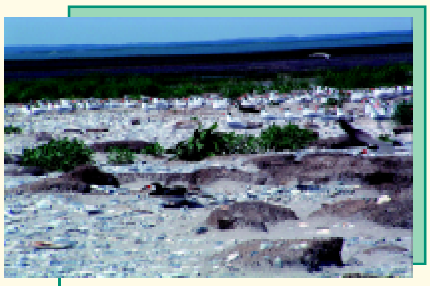
Improving Avian Habitat through Predator Removal

Historically, the Virginia Barrier islands have been among the most important nesting areas for shorebirds and colonial waterbirds on the entire Atlantic coast of North America. However decades of research have shown that beach nesting birds are in serious decline. Predation by the raccoon (*Procyon lotor*) and red fox (*Vulpes vulpes*) is a major factor in the decline of these birds. The Virginia Natural History Museum has been working with the Coastal Program since 1998 to develop and implement a plan to manage these predators and restore avian nesting habitat on the Virginia Barrier Islands.

To test for the effects of predation management, US Fish and Wildlife Service field staff removed red foxes and raccoons from six Virginia Barrier Islands including Assawoman, Fisherman, Metompkin, Myrtle, North Cedar, and Ship Shoal. Avian nesting was then monitored from June to August 2004 with some very promising early results. Bird numbers and nest productivity increased in most cases. Colonial waterbird abundance in 2004 was greater than the five year average between 1998 and 2003. Piping plover nest productivity was the highest, since 1980, on Assawoman, Metompkin, and Cedar Island. Oystercatcher nest productivity was the highest ever reported on Metompkin Island.

These results indicate that predator removal can be very effective but researchers note that it is seldom complete and remains a controversial subject. A new method is currently being evaluated. Instead of physically removing predators, project staff will attempt to "convince" predators not to eat the eggs through conditioned taste aversion. Oral-estrogen appears to be the most promising, effective, and safe "aversive agent" for reducing nest and egg predation. It is biodegradable, stable when injected into eggs, and shown to induce a conditioned taste aversion to shorebird, terrapin, and sea turtle eggs. Trials using oral estrogen are scheduled for the summer of 2005.

The Piping Plover nests on the beaches of Virginia's barrier islands. It has remained on the federal endangered species list since 1986 and is threatened by human distburbance, mammalian predation and habitat loss. *Photo courtesy of U.S. Fish and Wildlife Service.*



Black Skimmers and Royal Terns on Wreck Island.
Photo by Dot Field, DCR-NH.

Sustainable Ecotourism

First Ecotour Guide Certifications Awarded

The first Ecotourism Guide Certification Training Course was held in November 2003 by VIMS at the Eastern Shore Lab in Wachapreague. The day-long course included field and classroom work. Nineteen of the 24 attendees passed the required written final exam and received certifcates good for three years, as well as official ecotour guide logos denoting their new status as certified operators. A course to train ecotour guide instructors will be held in late fall of 2005.

Seaside Canoe/Kayak Water Trail

A Seaside Water Trail Map and Guide will soon be available. Developed by the Accomack-Northampton Planning District Commission, with input from many of the VSHP partners, this guide outlines over 100 miles of paddling routes through the barrier island system. Seven routes have been mapped between the Eastern Shore Wildlife Refuge in Cape Charles to Chincoteague Island. The water trail guide and a companion Web site will identify appropriate public access locations and cultural resources and amenities near those locations; expected paddling time and level of difficulty for each of the seven paddling routes; emergency and safety information; an overview of barrier island rules and regulations; and information on wildlife and conservation practices along the trail.

Organized canoe and kayak trips led by certified ecotour guides can help protect sensitive coastal resources and stimulate the economies of rural coastal counties.
Photo courtesy of Southeast Expeditions.

VIRGINIA ECOTOUR GUIDE
2004 - 2007

Virginia Seaside Heritage Program: Goals and Progress

Management and Education

Aquaculture Best Management Practices (BMP)

Working closely with the five largest members of the clam aquaculture industry, VIMS has developed a draft set of Environmental Codes of Practice and Best Management Practices. The draft ECOPs were presented at a 2003 annual meeting of clam growers on the Eastern Shore and received general endorsement. The draft set of BMPs are currently being refined and will be presented to industry members and other stakeholders at future public meetings. The ultimate goal is to get industry "buy-in" to this process along with their commitment to implement these BMPs.

VIMS is also working with the Center for Conservation Biology to understand how clam aquaculture affects the feeding activity of migratory shorebirds. Historical shorebird concentration data from 1994 through 1996 has been combined with clam net locational data from the southern portion of the seaside to produce a GIS map showing the actual overlap between shorebird foraging areas and clam aquaculture sites. Benthic samples have been taken at sites with and without clam aquaculture to determine the type and abundance of prey species available to shorebirds and the potential impacts of clam aquaculture on prey availability. The VSHP will focus on obtaining more recent shorebird concentration data as well as current shellfish lease ground data from VMRC. Preliminary data indicates potential conflicts between shorebird foraging and clam aquaculture may be limited. Shorebirds tend to feed higher in the intertidal zone than the clam aquaculture sites are located. This data will be important to consider when aquaculture best management practice guidelines are finalized.

The Seaside Heritage Program is addressing possible use conflicts on the seaside. One such study underway is focused on the interaction between aquaculture and other resources such as seagrass. Photo courtesy of VIMS.

Virginia Eastern Shorekeeper

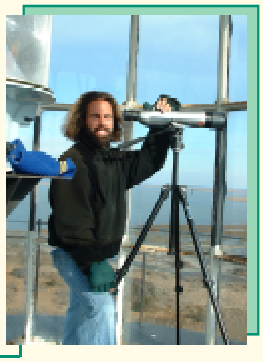
The Virginia Eastern Shorekeeper (Richard Ayers) logged over 420 hours on water patrol between 2003 and 2004. The Shorekeeper encourages community involvement and works with *Creek Watchers*, a group of volunteers who assist in monitoring, seaside patrols and beach cleanups. In 2004, the Shorekeeper produced a report documenting current human impacts to the natural resources of Barrier Islands. Recommendations include: clearly defining/posting colonial nesting bird areas; bringing property owners and land resource managers together to protect the resources without compromising private property rights; and developing consistent barrier island land use policy that addresses seasonally closed areas, public access issues, and enforcing "closed" barrier island areas.

An inventory of clam aquaculture netting and an assessment of its potential cumulative and secondary impacts to this fragile ecosystem was the focus of a 2004 report, "Discarded and Abandoned Aquaculture Clam Netting on the Atlantic Barrier Islands on the Eastern Shore of Virginia." This report indicates that there is positive momentum within the clam aquaculture industry to clean up these abandoned clam nets. Clam growers are working with the Shorekeeper to create a "Clam Net Hotline" to report discarded net which will be cleaned up by the growers. Preliminary results indicate that the netting has little short term environmental impact and acts in a very similar fashion to beach wrack. However future study is warranted due to the longevity of the netting and its possible long term cumulative impacts.

A common pollutant found on Barrier Island beaches is the plastic netting used in clam aquaculture. Photo by Richard Ayers.

Bird Migration Studies

The Virginia Coastal Program received a grant from the Virginia Department of Mines, Minerals and Energy to conduct the first systematic seabird migration watch on Virginia's seaside. The watch was was conducted in late 2004 through early 2005 by William and Mary's Center for Conservation Biology. The SeaWatch project was conducted from the 191 foot tall Cape Charles Lighthouse on Smith Island, using high-powered spotting scopes and binoculars. Spotters recorded 71,298 seabirds of 38 different species in late fall 2003 and 42,808 seabirds of 27 species in early spring 2004. The spotters recorded the birds' distance from shore and altitude above the water while a wireless weather station recorded meteorological conditions. This information will help DMME to better assess potential impacts of wind farms along the seaside of the Shore.



Using a high-powered spotting scope , a member of the SeaWatch Project Team records the numbers and flight patterns of migrating seabirds above Smith Island on the Eastern Shore. Photos courtesy of William and Mary.

Virginia Seaside Heritage Program: Goals and Progress

Educating Landowners about Phragmites

In April and May 2005, DCR offered *Phragmites* workshops in Accomack and Northampton Counties which focused on the history, ecology, abundance, and control methods for *Phragmites* as well as strategies private landowners can apply to fight *Phragmites* invasions. Workshop news articles and other printed materials will continue to be used in 2005-2006.

Beach Nesting Bird Brochure

A new brochure, "Life on the Beach Isn't Always Easy," is now available to help educate barrier island visitors about the critical role island habitats play in the life-cycle of beach nesting birds. Thousands of birds nest on the beaches of the barrier islands each year from April to September, which coincides with the height of tourism in the region. The survival of beach nesting birds on the islands is already difficult due to predation on eggs and small chicks, and natural forces such as storm waves and high tides which threaten to wash the nests away. People using these beach can also affect the birds' survival by accidentally stepping on nests, bringing dogs to the island, and leaving trash on the islands which attract predators to these areas. The brochure, developed by the Seaside Heritage Program partners, is available at ecotour shops, visitor centers, waterfront information kiosks and on the Web at www.deq.virginia.gov/coastal/vshp/hompage.html.

Internet Mapping System: Online Tool for Long-Term Management Strategies

The Seaside Internet Mapping System, developed and maintained by the Virginia Coastal Program Office, serves as the foundation for long term restoration and management strategies for the seaside of Virginia's Eastern Shore. The IMS includes data layers for the Seaside Water Trail, major seaside public access locations, barrier island ownership and access, forest change analysis in Northampton County, shorebird concentration layers (1994-1996), colonial waterbird survey, oyster restoration sites, seagrass restoration sites and *Phragmites* coverage.

As new geospatial data is collected it will be added to the Seaside IMS. In the future, visitors to the site will be able to query a database for specific datasets.

Visit the Virginia Seaside Heritage Program Internet Mapping System (IMS) (www.deq.virginia.gov/coastal/vshp/boundaries.html).

Seaside Management Plan

In the fall of 2005, the Virginia Coastal Program will begin development of a draft seaside management plan. Drawing on the experience and the research and restoration efforts of the Seaside Heritage Program partners, the draft plan will begin to formulate recommendations for improved policies to protect seaside resources and promote sustainable industries.

For more information on the Virginia Coastal Program or the Virginia Seaside Heritage Program, call Laura McKay at (804) 698-4323 or Scott Lerberg at (804) 698-4537 or visit the Web at www.deq.virginia.gov/coastal/

Seaside Program Core Partners

National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management
Virginia Coastal Program at the Department of Environmental Quality
Accomack-Northampton Planning District Commission
Southeast Expeditions
The Nature Conservancy
University of Virginia
US Fish and Wildlife Service
Virginia Commonwealth University
Virginia Department of Conservation and Recreation, Division of Natural Heritage
Virginia Department of Game and Inland Fisheries
Virginia Department of Mines, Minerals and Energy
Virginia Eastern Shorekeeper
Virginia Institute of Marine Science
College of William & Mary, Center for Conservation Biology
Virginia Marine Resources Commission
Virginia Museum of Natural History

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